

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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The Preservation of Our Industries

SINGLENESS of purpose describes the mind of the nation at this moment and nobody will allow the prosecution and the winning of the war to be hampered or hindered by any other consideration, however weighty and important it may be. But the winning of the war, and of the peace that is equally important, is not quite the simple matter that it would appear to be now in the height of the battle. We must in justice to ourselves think of some of the consequences of the things we are doing and some of the troubles that we are undoubtedly laying up for the future. It will, for instance, be a sorry situation if, having signed a satisfactory peace in Berlin, we look back to find our commercial and industrial structure in ruins. A certain amount of ruin there is bound to be, not merely the incidental ruin of the destruction of premises, but the loss of goodwill, the dismemberment of business organisations, and the destruction of markets. All these things will have to be repaired by our traders and our industrialists, and we should do what is possible, while devoting ourselves to the war, to make sure that these traders and industrialists will be in a position when the war is over to function for the national good.

There are those who seem to think that the war will be the better won if at the same time we destroy the present economic system. That view is admittedly held, and indeed even in these times advocated, by several members of the Government itself. We have before us fresh in our memories the experience of the years following the Kaiser's war, when, thanks largely to Excess Profit Duty and partly to control, whole industries were left in a condition of helpless bankruptcy. There followed unemployment and the troubles of the early 'twenties. We should in these days be profiting from that experience.

Manufacturers generally are far too busy carrying on with war production to give even a thought to the troubles into which many of them are running. As a class they display a patriotism which is beyond praise. Chambers of Commerce and manufacturers' associations have tended in recent years to become so thoroughly bureaucratic as to fail to function from the private enterprise point of view. We are pursuing the hundred per cent. E.P.D. policy; we are maintaining, although under pressure it is largely inoperative, all the harassing annoyance of complicated costing checks and systems; we are applying with unnecessary ruthlessness the theory of control; and we are also leaving innumerable questions for settlement in the future. Orders are placed and executed, the figuring being

postponed to some unspecified later date. One way or another the manufacturing classes are functioning to capacity and showing a minimum of concern for their own self-interest.

The position, complicated as it is, can be seen at a glance and in its simplest form by reference to the Stock Exchange price list. We can all agree that there should be no war profiteering, but reasonable people will feel that manufacturers, devoting their energies to war production, should at least be no worse off than they were before war production was required. The uncertainty of the whole situation is reflected in the fluctuations of share prices, as the following table shows. We select a dozen well-known industrial institutions and give the highest and lowest quotations for their shares during the first ten months of 1940. The Stock Exchange, which is the best index of commercial values, has within this period bought and sold shares of these representative concerns at prices which on the average show variations of 300 per cent.

Swan, Hunter	...	...	39/3	—	17/6
Stewarts and Lloyds	...	...	47/9	—	27/10½
Thornycrofts	...	...	35/3	—	16/3
Vickers	...	...	21/10½	—	9/1½
Beardmore	...	...	24/3	—	11/6
John Brown	...	...	35/4½	—	13/1½
Cammell, Laird	...	...	8/10½	—	3/6
Dorman, Long	...	...	28/1½	—	12/6
Staveley Coal and Iron	...	...	54/9	—	33/6
Imperial Chemicals	...	...	33/7½	—	17/9
Cables and Wireless	...	...	65½	—	27

Perhaps the most striking of the many anomalies that emerge from the present industrial chaos is that businesses should be earning more and paying less. Among mines, where dividends are partly interest and partly return of capital, we find the Rhokana Corporation earning £660,000 more than last year and cutting the dividend from 50 per cent. to 40 per cent., and that is typical. The cement trade has never been so busy; it is working to the maximum of its capacity; and Associated Portland Cement shares run from 62s. 6d. to 38s. 9d. between January and October. Eastwoods pay 5 per cent. against 8 per cent., and so on through the list.

These indications point to a state of affairs that ought not to be. It matters nothing, and we freely admit it, while the war lasts. If manufacturers are prepared, as they are prepared, to work without profit, and if banks are prepared under pressure from the Government to finance shaky enterprises, we can win the war that way. But we are laying up sore troubles for everybody when the happy day of peace arrives.

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NOTES AND COMMENTS

Wholesale Prices in October

THE Board of Trade Index Number for wholesale prices of industrial materials and manufactures for the month of October is 142.3 (1930, 100); for chemicals and oils the figure is 121.2; for iron and steel 163.5, and for non-ferrous metals 123.4. Compared with the September figures, that for chemicals and oils represents an increase of 1.0 per cent.; that for iron and steel an increase of 0.1 per cent.; and that for non-ferrous metals an increase of 0.3 per cent. In the past twelve months (that is, since October, 1939), the respective increases are 23.4, 25.9 and 17.6 per cent. The rise in the chemicals and oils group was mainly due to the increases during September for petroleum products, but the only important alteration in the metal groups was an increase of about 8 per cent. in the price of rain-water pipes. The aggregate increase in the prices of industrial materials and manufactures since the outbreak of war is 40.1 per cent., and in comparison with September the rise was 0.7 per cent., the slight decrease recorded in September as against August not having been maintained.

Textile Fabric from Seaweed

FOR some time past unconfirmed reports have been circulating in relation to the development of a new textile from seaweed, and last week the official announcement was forthcoming that a material satisfying all reasonable needs had been produced. Dr. J. B. Speakman and the Textile Research Department of the University of Leeds, of which he is the chief, are to be warmly congratulated on a scientific and industrial achievement of the highest importance. Putting aside scientific considerations for the moment, it must be conceded that the most striking feature of the new process is that an unlimited supply of the principal raw material is available and easy of access. The wrack, or seaweed, of the Atlantic coasts of Scotland and Ireland, which used to be gathered for purposes of iodine extraction, grows in vast tangled masses of un-

explored extent. This seaweed, dried, contains from 20 to 30 per cent. of alginic acid, which is easily extractable by way of a weak sodium carbonate solution and treatment with sulphuric acid. The resultant viscous solution, when squirted in the time-honoured way through spinnerets into a coagulating medium, can be drawn off in the form of a thread. This fact has been known for some time, but the first threads produced were rough and coarse, and adhesive in tendency. Emulsification produced a satisfactory silk-like finish, however, but the filaments remained obstinately soluble in alkalis, an obvious drawback. How this drawback was obviated is Professor Speakman's discovery, and the process is not yet disclosed. Other interesting features of the new fabric include its fire-resisting properties, its comparatively slight affinity to water, and its suitability for dyeing. As it can be produced by means of the machinery already existing for rayon manufacture, there is every hope that production on a commercial scale will start within a very few months.

Synthetic Textiles in Germany

MEANWHILE it is reported that I.G. Farbenindustrie have built new plant for the manufacture of their synthetic textile fibres "PeCe," which is a polyvinyl chloride product derived from coal and lime via calcium carbide, acetylene and vinyl chloride. The Germans claim that the advantage of their fibre is that it requires neither cleaning nor sterilisation prior to manufacture, that it is acid-resisting and heat-resisting, that it does not absorb water and that it is more elastic than natural silk. Experiments to improve the firmness and elasticity of the fibre as well as to increase its fire resistance and non-conductivity are now being carried out. Its durability is stated to be ten times greater than that of cotton or wool. PeCe is a sister product of "PC-U," a synthetic bristle which is to replace natural bristles in Germany.

Sir Oliver Lodge's Research Notes

A COLLECTION of the late Sir Oliver Lodge's books, pamphlets and manuscript notes on his original researches has been handed by his representatives to Liverpool University Library. The collection has been chosen with a view to typifying the affection he always felt for Liverpool, where much of his best work was done. It includes a small selection of books from his library, and twenty-seven pamphlets on educational and philosophical subjects, some of them very scarce, presented to him by colleagues and other Liverpool men of learning while he was Professor of Experimental Physics at University College. His own work as a scientist is comprehensively illustrated by sixty-seven reprints of articles by him. In addition, there are thirty manuscript volumes, partly his notes as a student, partly drafts of his lectures, and, most interesting of all, notes of the researches carried out while he was experimenting in Liverpool, including accounts of his famous experiments on wireless waves and on the problem of ether drift.

RAYON EXPORT ARRANGEMENTS

Registration of Central Rayon Office, Limited, as a company is expected to take place in about a fortnight. The company is being formed under the auspices of the rayon export group. Sir Percy Ashley, who is also Cotton Controller, will be chairman, and the other directors will be leading representatives of the British rayon producing and export trade.

ABSORPTION OR SCRUBBING TOWERS

Their General Uses and Method of Erection

by A. C. H. PRYCE

IN these days there are few manufacturers who do not use, for some process, acids or other chemicals which are liable to give off noxious fumes. In such cases, adequate precautions must be taken to avoid the pollution of the atmosphere in the neighbourhood of the works, and for this purpose absorption or scrubbing towers are in general use. Where an installation of such towers is being considered, the following notes may be found helpful.

Towers of this description are usually vertical and of circular section, made up of stoneware or acid-resisting metal section, or built in brickwork. They consist essentially of an outer shell, with inlets and outlets for gases and liquids, the long and intimate contact of which is ensured by an internal filling or "packing." In most cases the absorbing or scrubbing liquid is fed to the top of the tower and falls by gravity, while the gas flow is induced in a counter direction by means of a suitable fan or ejector.

Owing to the extremely corrosive action of the gases or fumes which are encountered, chemical stoneware is the material which is usually chosen for towers of this description, as it is proof against the attack of all acids and most other corrosive agents except hydrofluoric acid and hot caustic alkalis. Further, standard sections in many sizes are kept in stock by the manufacturers, making possible the quick assembly of towers for widely varying duties.

When the sole purpose of the plant is to prevent the emission of noxious gases to the air, and the recovery of the liquid used is of no consequence, towers are often installed as single units. A section of a typical tower packed with stoneware rings and fitted with a stoneware ejector for inducing the gas flow, is shown in Fig. 1. It will be noted that the gases are admitted to the lower part of the tower, at a point about half way up the bottom section. Above the gas inlet is a perforated stoneware plate which supports the necessary packing or filling. The gases gradually pass up the tower, which is fitted with further perforated plates where necessary to support the packing, and finally the gases emerge through an outlet in the cover or in the side of the top section.

The liquid is introduced through the cover of the tower and is fed to the centre of a specially designed stoneware plate, which distributes it evenly over the whole area. The plate, if the gases are taken through the cover, is of such a design that adequate free space is given for their passage to the outlet. If the gases are taken off below the distributor plate, smaller and more numerous distributing holes can be arranged, as the gas flow through the plate need not then be considered. The liquid falls by gravity over the whole of the packing material to the base of the tower, where the necessary ports for its collection or release are situated. Such a unit is quite suitable for the absorption of small quantities of fumes from pickling plants and the like.

Where larger volumes are to be dealt with, and the recovery of the liquid is important, a battery of several towers in series, with the necessary arrangements for re-circulating the liquid and

adding to it as required, is desirable. In the second illustration is shown a battery of eight towers equipped with a large stoneware ejector for inducing the gas flow, and Pöhle lifts, actuated by means of compressed air, are used for liquid circulation. Such batteries of towers are most useful for the absorption of nitric acid fumes, concentrating the resultant acid, and for similar duties.

When contemplating the installation of a tower or battery of towers, the following points should be considered, as they influence not only the diameter but the working height of the units:

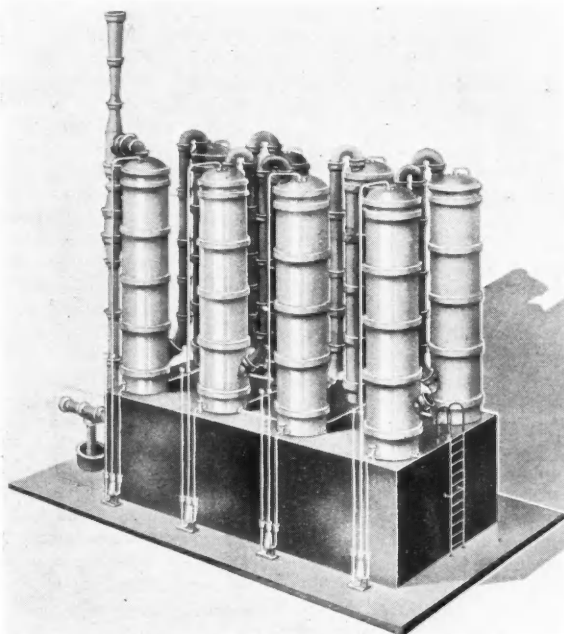


Fig. 2. Battery of large stoneware towers, with fume ejector

- (1) Volume of gas to be handled per hour.
- (2) Size and type of tower filling to be employed.
- (3) Quantity and rate of liquid flow.
- (4) Temperatures of gas and liquid.
- (5) Length of time intimate contact must be maintained between gas and liquor in order to effect complete absorption or reaction.
- (6) Available draught or pressure for promoting gas flow.

It is of prime importance that the rate of flow of the gas should not be so great as to cause entrainment of the liquor, either in the packing or on the perforated plates, and for this reason it should be carefully regulated. As the pressure which is required to force the gas through the tower increases with the height, a reasonable compromise between diameter and working height should be aimed at. Stoneware towers are usually between 10 and 20 feet in height.

Tower fillings of various shapes and sizes can be used, from broken lump quartz or porcelain to special packings of quite intricate designs, but by far the most widely used and probably the most efficient, particularly when costs are taken into account, is the plain cylindrical tower packing ring—originally developed by Raschig.

The erection of a tower or battery must be carefully considered. First a smooth flat surface is necessary for the base of the tower to rest on, as the complete weight of the tower, packing, connecting pipes, and absorbing

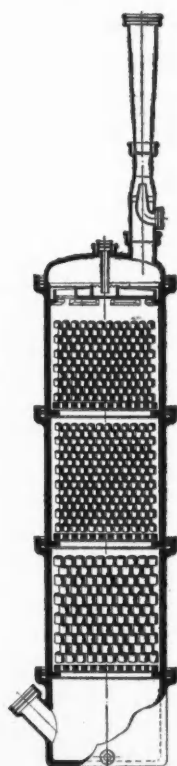


Fig. 1. Section of typical stoneware tower fitted with ejector

liquid is considerable, and if the tower consists of more than three or four sections it is usually an advantage to take the weight of each section under the socket of the pipe, wood or metal scaffolding being used for this purpose. Provision should always be made for expansion due to variations in temperature. The space between the spigots and sockets at the joints must be sealed with a suitable acid-resisting cement or putty. It is best in all cases to use a jointing which does not set quite hard, so that the tower can be dismantled for cleaning or inspection if necessary.

Should it be decided to use Pohle air lifts for re-circulating the liquid, it is necessary to have available an air supply at from 5 to 10 lb. per sq. inch pressure, and the lift or elevator bottle must be a distance below the liquid outlet equal to one-third of the total height to be lifted—in other words half the actual height of the tower. Sometimes instead of an air lift

of this type a stoneware pump is used. When the towers are operated under suction, the ejector may be designed to work either from a fan or a compressed-air main, and where very large volumes of gas are to be handled it is sometimes advisable to use a stoneware fan in its place.

Properly designed and erected absorption units of this type, once installed, are practically trouble-free, and when the absorbed acid is collected and concentrated, they often not only overcome a nuisance, but the reclaimed acid pays for the purchase and installation of the plant in a very short time.

A few other uses to which towers of this type can be put include the drying of air by means of sulphuric acid; humidification of air; washing of flue gases, etc., and towers of special design can be produced for a variety of other duties.

Polymers from Olefines

Increasing Technical and Industrial Uses

by LOUIS LIGHT, M.Sc., Ph.D., A.I.C.

MATERIALS formed by polymerisation of mono-olefines (such as ethylene) and of diolefines or dienes (*e.g.*, butadiene) seem destined to play an increasingly important part in industry. Research work undertaken in the last few years in various countries has shown how the nature of the end products can be controlled with the aid of specific catalysts and variations in the general reaction conditions. The potential range of materials has also been widened by applying the fertile principle of copolymerisation to mixtures of two or more olefinic or diolefinic bodies.

If ethylene (or propylene) free from oxygen or sulphur is polymerised in presence of aluminium chloride in an apparatus ensuring non-contamination with iron, polymers can be isolated as viscous liquids of value as aircraft engine lubricants. This process, developed shortly before the war by the I.G. (U.S.P. 2,165,372-3), is significant in view of the impression prevailing in some quarters of an impending shortage of lubricants for German aircraft. The actual position is that Germany is comparatively well placed for obtaining ample supplies of ethylene and aluminium salts. Aluminium fluoride also catalyses the polymerisation of olefines (as well as of diolefines) to yield liquid products (I.G.; U.S.P. 2,195,747). In England a great deal of attention has been given to the manufacture of solid polymers of ethylene. According to E.P. 471,950 (I.C.I.), solid materials which can be moulded and fabricated into threads and films are made by exposing ethylene to a pressure of at least 1200 atm. at high temperature in presence of a trace of oxygen. Operation at rather lower pressures gives rise to semi-solids or greases.

One of the diene polymers that has received great publicity is the sodium-polymerised butadiene rubber (buna) of the I.G. The diene polymerisation can, however, be so conducted as to yield a whole series of products ranging from oils to hard, horny solids. One of the best catalysts in this connection is an anhydrous hydrogen halide. Preliminary low-temperature polymerisation (at $-20^{\circ}\text{C}.$) of the liquid butadiene in presence of an anhydrous hydrogen halide is recommended in E.P. 500,760 of the I.G. This step is followed by separation of a more volatile fraction and further polymerisation of the residue. The aluminium fluoride catalyst of U.S.P. 2,195,747 mentioned above has also been used in the *vapour phase* polymerisation of butadiene to give pale-coloured oils boiling at not higher than $200^{\circ}\text{C}.$

Copolymerisation Products

Improved products resulting from polymerisation of mixtures of olefines and dienes are now widening the range of synthetics still further. A familiar example of this tendency is butadiene rubber, which is likely to be superseded for

many purposes by copolymers of butadiene and styrene, or butadiene and acrylonitrile (both styrene and acrylonitrile contain olefinic bonds).

When a mixture of butadiene and ethylene is polymerised by the high-pressure, high-temperature technique of E.P. 471,950 (see above), a soft rubbery solid can be obtained; under similar conditions a mixture of ethylene and styrene yields products of varying degrees of toughness or rubberiness according to the proportions of ingredients; a soft wax melting at $60^{\circ}\text{C}.$ is derived from a mixture of ethylene and limonene (E.P. 497,643; I.C.I.). On the other hand, by using a catalyst of the aqueous boron fluoride type and operating in the vicinity of ordinary temperatures and pressures, Du Pont (E.P. 516,931) have produced liquid polymers from olefine-diolefine mixtures. An oil with lubricating properties is thus prepared from *n*-octene-1 and butadiene; drying oils for varnishes are derived from mixtures of butylene and chlorobutadiene, or from butylene, isobutylene and butadiene. Finally, it may be noted that the latest synthetic rubber to attract attention (the butyl rubber recently announced by the Standard Oil Development Company) is the product of copolymerisation of the olefine (presumably butylene or isobutylene) and a small proportion of a diene (presumably butadiene). This type of rubber is distinguished by the virtually complete saturation of its molecule after vulcanisation, which makes it exceptionally resistant to chemical agents.

British Rheologists' Club

Inaugural Meeting

THE inaugural meeting of the British Rheologists' Club (which concerns itself with the flow and deformation properties of materials), was held on November 16 at the University of Reading. The meeting was remarkably well attended, demonstrating the need for such a club—members coming from all parts of the country. Prof. J. A. Crowther, Professor of Physics in the University, presided. The morning session was devoted to a discussion of "Rheology in Industry," the opening speakers being Mr. J. Pryce Jones and Mr. F. D. Farrow.

After lunch the meeting adjourned to the National Institute for Research in Dairying at Shinfield, where by kind permission of the Director, Prof. H. D. Kay, the rheological apparatus of the Institute was shown and tea was taken. It was generally agreed that all who attended the meeting would now return to their various problems in rheology, many of which are now of national importance, with fresh ideas and new weapons of attack.

War Damage

Position of Lessees and Mortgagees Explained

NOW that the question of damage to property from war action has become more insistent, it has been thought that an explanation of the Landlord and Tenant (War Damage) Act, 1939, may be useful, as this measure has been passed to meet the circumstances of war damage, and questions arising therefrom between landlords and tenants.

This Act provides that, notwithstanding any arrangement—written or oral—concerning the person responsible for repairs, any obligation to repair is not to have legal effect so far as concerns damage caused by war action. Furthermore, if any damage other than war damage necessitates repairs, and owing to the extent of the war damage it is impracticable or only practicable at an unreasonable cost to execute these, or such repairs would give no substantial advantage to the person entitled to benefit (e.g., the landlord), the obligation to repair such damage is to be suspended until the war damage is made good.

By this Act, if premises suffer war damage, it is obligatory upon the tenant or mortgagor, where there is an obligation in the lease or mortgage to undertake repairs, to notify the landlord or mortgagee as soon as possible of the damage, and as far as possible to give the general nature of the damage, and also to allow access to the premises by the landlord or mortgagee (or authorised representative).

Although any obligation to repair does not apply so far as war damage is concerned, this Act introduces special provisions for leaseholds (where ordinarily the tenant would be responsible for repairs) as regards the making fit for use premises made unfit for use by war damage. The tenant can serve upon the landlord a "notice of disclaimer" meaning that he elects to disclaim the lease, or a "notice of retention," meaning that he elects to retain the lease on certain terms (explained in the next paragraph).

If a "notice of disclaimer" is sent and accepted by the landlord, this amounts to a surrender of the lease, and the

tenant has no further interest or responsibility in the matter; if a "notice of retention" is served, this means that the tenant accepts the responsibility of making the premises fit for use, but no rent is payable until the premises are made wholly fit for use, although if part of the premises can be used, a rent proportionate to the part fit for use may be payable.

An important point to note, however, is that if a landlord wishes to keep a lease alive, he is not obliged to accept a disclaimer notice; he can do so by serving a notice, called "a notice to avoid disclaimer." This means that the landlord then undertakes to make the premises fit for use as soon as possible, and no rent is to be payable until the premises are made wholly fit for use, but if part of the premises is considered as being capable of beneficial occupation, a rent proportionate to that part may be payable.

Another point that may arise is covered, that is if a tenant sends no notice at all, the landlord can serve on the tenant a notice called a "notice to elect," and then if no reply is received within a month, it is to be assumed that a "notice of retention" has been sent.

Provision is made for a court (County Court; in some cases High Court) to decide questions where it is claimed that the premises are not rendered unfit by war damage. This applies where a lessor claims that a disclaimer notice has no effect by reason of this fact, and also similarly where a tenant claims that a "notice to elect" should not apply.

A point to remember always is that although the procedure of this Act determines the person who is responsible (e.g., lessor or lessee) for making premises fit for use after damage by war action, in the final event the Government will pay compensation, and, so that compensation can be assessed at the end of the war, the relevant local authority should be notified of the damage, and application made for a form of claim.

Cornish "Spitfire" Fund

China Clay Contribution from New York

THE china clay district of S.W. England has subscribed over £6000 for the local "Spitfire" Fund, towards which those interested in the china clay business in New York have contributed £300. This subscription came about through the receipt of a letter by Mr. F. S. Liddicoat, local director of the Anchor China Clay Co., from a friend in New York, who wanted to do something as the qualities of the spitfire fighters and their pilots had fired the imagination of business men in New York. After consultation with Mr. J. Keay, of the English Clays Lovering Pochin and Co., Mr. Liddicoat cabled "Expect you to complete the St. Austell Spitfire Fund. £300 wanted." At 6.55 p.m. the same day Mr. Liddicoat received the reply: "Have got the £300 and sending forthwith." The committee were greatly encouraged and this was regarded as a very fine achievement characteristic of their swiftness of action and their desire to support this country in their great task.

Colouring Material from India

Kamala and its Uses

EXPERIMENTS recently carried out at the Forest Research Institute, Dehra Dun, India, give encouragement to the formation of a local dye industry utilising the dye known as Kamala, an orange-red powder consisting of minute glands and hairs from the fruit of an evergreen tree of the genus *Mallotus*. According to *Science and Culture*, 1940, 6, 4, 224, the colouring matter, being non-toxic, and soluble in oils and fats, is suitable for colouring hair oils,

etc., while its water-soluble sodium and ammonium salts would be available for tincturing aerated waters.

The tree is common in the United Provinces, Bengal, Bombay and Orissa. The ripe capsules are gathered in February and March and the colouring powder is collected either dry, by simply shaking the capsules into a receptacle, or wet, by stirring the water and collecting the sediment in the form of cakes.

Chemical Constants of Lac

Report of Recent Investigations

THE acid value of lac has been determined by Dr. B. S. Gidvani and Mrs. J. M. Dobbie with three different indicators. Alkali Blue 6B as an internal indicator gives a sharp end-point; it has been found preferable to use 0.1N alcoholic potash for titration instead of the customary 0.5N. It has been found that at least four hours' heating on a water bath with 0.5N alcoholic potash is necessary to effect complete saponification of lac; further, complete saponification is not obtained with absolute alcoholic potash; the presence of water is necessary, optimum results being obtained with 10 per cent. of water in the alcoholic potash. For determination of the hydroxyl value of lac, Normann's method has been found convenient and gives reliable results, but it is necessary to allow at least four hours' refluxing with 0.5N 90 per cent. alcoholic potash to saponify the acetylated lac product completely.

Details of the experiments and tests carried out by the above investigators are contained in the latest publication of the London Shellac Research Bureau (India House, Aldwych, W.C.2), entitled "Chemical Constants of Lac—Some Notes on the Acid, Saponification and Hydroxyl Values of Lac."

A Chemist's Bookshelf

ORGANIC SYNTHESIS, Vol. 20. Ed. Charles F. H. Allen. London: Chapman and Hall. Pp. 113. 10s. 6d.

In its familiar red cover the annual American volume devoted to revised methods for the laboratory preparation of previously known chemicals now makes its welcome appearance for the twentieth time. Once again the admirable arrangement used in previous volumes has been followed: method of preparation followed by notes on particular details and finally by a summary of the earlier methods in the literature. To indicate the scope of the new volume we cannot do better than reproduce a list of the chief organic chemicals for which new or improved methods of preparation have been evolved:—

Beta-(3-acenaphthoyl)-propionic acid; acetyl acetone; 9-anthraldehyde; *d*-arabinose; 1,2,3-benzotriazole; 6-bromo-2-naphthol; tertiary butyl acetate; cysteic acid monohydrates, decamethylene bromide; dehydroacetic acid; *trans*-dibenzoyl ethylene; dibenzoyl methane; di- β -arboethoxy ethyl methylamine; α,α -dichloroacetamide; dimethylethynyl carbinol; 5,5-dimethyl hydantoin; 2,2'-dinitrobiphenyl; diphenyl ketene; *n*-dodecyl *p*-toluene sulphonate; fumaryl chloride; furyl acrylic acid; *ortho-n*-heptyl phenol; 2-hydroxy-5-nitrobenzyl chloride; mandelanide; methyl- β -bromopropionate; *N*-methyl formanilide; methyl myristate and palmitate; monoperphthalic acid; 5-nitroindazole; pentaacetyl *d*-glucosonitrile; phenyl cinnamate; picolinic acid hydrochloride; *dl*-serine; sodium amide; terephthaldehyde; α -tetralone; 2,3,4,6-tetramethyl glucose; *dl*-threonine; *dl*-valine.

Apart from the value of the volume to research workers on dyestuffs, pharmaceuticals, biochemistry, perfumery, etc., there are many useful hints on general laboratory procedure which can be commended to the attention of advanced students. Another useful feature is the reference to sources of supply of the newer reagents, in which connection the reviewer was interested to note that boron fluoride (a most valuable polymerisation catalyst in many reactions) is now sold in cylinders by an American firm.

HANDBOOK OF CHEMICAL MICROSCOPY, Vol. II, 2nd Ed. By E. M. Chamot and C. W. Mason. New York: John Wiley and Sons. London: Chapman and Hall. Pp. 438. 30s.

In this new edition of an invaluable work, while much of the text remains unaltered, substantial additions have been made. Some parts of the original text have been remodelled or rewritten to attain more precision. New methods of heating, evaporating, filtering and carrying out reactions are adequately described; the section dealing with the approximate determination of *pH* is amplified. Cation analysis is further systematised, and the polythionates are included in the "sulphur group" of anions. Uses for a number of new organic reagents are detailed.

Hypercritical readers might wish to see more mention of reported methods which the authors have found to be unsatisfactory. For example, luteocobaltic chloride as a reagent is dealt with, but no mention appears to be made of the other complex amines recommended by Yanowski and Hynes. Anthranilic acid is not mentioned. Sheintnis' work on hexanitrodiphenylamine is described, but not the divergent results of Shapiro's investigations. A critical treatment of such cases by the authors, or else mention that they have not yet been tested, could save many users of the book much spade-work. In passing, the use of the synonym "hexamine" for both hexanitrodiphenylamine and hexamethylenetetramine may well lead to some confusion. However, these criticisms are relatively minor when placed against the prime value of the work as a whole.

Recasting the type to include the fresh matter has, if anything, enhanced the attractive lay-out which characterised the previous edition. There are a number of new diagrams and photomicrographs, and those carried over from the first edition are even more finely reproduced than before.

ADVANCED READINGS IN CHEMICAL AND TECHNICAL GERMAN.

By John Theodore Fotos and R. Norris Shreve. New York: John Wiley and Sons. London: Chapman and Hall. Pp. 304. 15s.

This is the last volume of a series of four chemical and technical readers that have been prepared through the co-operation of the School of Chemical and Metallurgical Engineering and the Department of Modern Languages at Purdue University. The purpose of these books is to facilitate the study of German for chemists and students in related fields and to introduce them to the form and appearance of technical German as it is found in the important German technical publications. The selections which were made from practical reference books (Ullmann; Houben; Meyer und Jacobson; Beilstein; Oberhoffer; Guertler) are very well chosen and they illustrate not only a variety of subjects, but also variations in style and vocabulary, and they are completed with tables, bibliographical references, abbreviations, etc. The introduction includes a review of "Reading Difficulties of Scientific and Chemical German." As chemical research and chemical industry are farthest advanced in England, in America and in Germany, this book will be most useful for English-speaking scientists. It would answer its purpose just as well without the addition, in the German-English vocabulary of approximately 2250 words, of the frequency with which these appear in the selections to be read.

Mercury in British Columbia

Important Cinnabar Deposits

IN view of the fact that a high proportion of our supplies of mercury normally originate in Italy and Spain, the efforts towards self-sufficiency in Canada, which have been stimulated by the present situation and the high price of the metal, are worthy of note, and are recorded in the *Bulletin of the Imperial Institute* (1940, 38, 3, p. 373).

Deposits of cinnabar have been known for a considerable number of years in British Columbia, the most important of which are those situated at Pinchi Lake to the east of Stuart Lake in the Fort St. James district. The latest developments at this property, which was recently visited by the British Columbia Minister of Mines have been so encouraging that an increase in the capacity of the plant from 75 to 100 tons per day is stated to be under consideration. According to the *Northern Miner*, June 27, 1940, ore valued at \$40 per ton is being treated at this plant, which is expected to produce mercury to the value of \$750,000 in the first year of operation. As these calculations are based on a mercury price of \$2.50 per lb. at the time of the Minister's visit, it would appear that the ore averages 16 lb. of mercury per ton. This 0.8 per cent. ore, therefore, may be compared with an average of 5 per cent. in Spain, 0.79 per cent. in Italy, and 0.35 per cent. in the United States.

A detailed description of the Pinchi Lake deposit and others in this province has recently been made by John S. Stevenson in a recent Bulletin of the British Columbia Department of Mines, and abstracts from it are included in the Imperial Institute's publication.

Samples of felt in fourteen different colours, under the heading of "Suggestions for Early Spring Sampling," are attached to a card issued by S. HUBBARD, LTD., Luton.

"Simple Tests for Identifying Metals" is the title of a useful feature in the October issue of "Oxy-Acetylene Tips," published by the LINDE AIR PRODUCTS COMPANY, New York.

A comprehensive revised list of the chemical commodities they supply has been issued by the REPUBLIC CHEMICAL CORPORATION, Beekman Street, New York. It is pointed out that erratic fluctuations make it impossible to set fixed prices which will hold good for a reasonable period.

Personal Notes

BAILIE J. A. PENNY, manager of the Scottish C.W.S. soap works, Grangemouth, has been promoted senior bailie of Grangemouth Town Council.

MR. and MRS. R. B. HODGSON, of Linden Avenue, Darlington, celebrated their golden wedding last week. Mr. Hodgson, until he retired a little time ago, was managing director of the Whessoe Foundry and Engineering Co., Ltd., Darlington.

PROFESSOR ROGER ADAMS, head of the chemistry department of the University of Illinois, has been appointed chairman of the American Chemical Society Group for the correlation and support of scientific research on instruments and devices of warfare.

Lord Trent, chairman of Messrs Boots Pure Drug Co., on November 11 presented a gold watch each to Mr J. T. ELLIOTT and MR. J. SLADEN to mark the directors' appreciation of their 50 years' service with the firm. Since the Beeston factory was opened Mr. Elliott, who joined the firm in 1890, has been manager of the speciality packing department. Mr. Sladen, whose connection with the firm dates back to 1889, has for many years been in charge of the manufacture of salines.

OBITUARY

MR. R. DEMUTH, who died recently at Exeter aged 75, had formerly been engaged in chemical manufacture in London and the Dominions. He erected the first sulphuric acid plant in Australia and made the first colloidal sheep-dip in South Africa.

British Chemical Prices

Market Reports

THE position of the leading industrial chemicals shows little change from that recorded last week. Practically all sections of the market report a steady spot demand covering fair average quantities, whilst deliveries to consumers under existing commitments are quite good. An improved demand is reported for the barium compounds and there is a good market for most of the acid products. In the potash section movements continue to be restricted by the supply position and quoted rates are firm. There is little fresh news in other directions, the tone generally having a firm tendency. An active interest has been maintained for xylois and toluols and a steady inquiry is circulating for the naphthalenes. Dealers generally appear to be marking time pending the issue of the new Control Order by the Ministry of Mines.

MANCHESTER.—Values in most sections of the Manchester chemical market during the past week has continued to display a firm tendency, though actual changes on balance have been few. Taking the market by and large, sellers have little of which to complain regarding the general movement into consumption, especially to the textile bleaching, dyeing and finished trade, which are absorbing fairly satisfactory quantities. With regard to fresh bookings inquiry during the week both from home users and for shipment has been moderate. In the by-products market there has been a generally satisfactory inquiry for the light materials, the xylois and solvent naphtha strong sections.

GLASGOW.—The Scottish heavy chemical trade has slightly improved in the last week for home business. Enquiries for export have fallen off. Prices still remain firm at the previous levels.

Price Changes

Antimony Sulphide.—Golden, 9½d. per lb. Crimson, 1s. 11d. per lb.
Cadmium Sulphide.—6s. per lb.
Carbolic Acid.—MANCHESTER: Crystals, 10½d. per lb., d/d; Crude, 3s. 9d. to 4s. naked at works.
Carbon Black.—5½d. per lb.
Hexamine.—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.
India-rubber Substitutes.—White, 6½d. per lb.; dark, 6d.
Naphtha.—MANCHESTER: 90/160°, 2s. 1d. to 2s. 3d.
Potassium Bichromate.—Crystals and granular, 6½d. per lb.; ground, 7d. per lb., carriage paid. MANCHESTER and GLASGOW: 6½d. per lb. in original casks.
Rosin.—25s. to 30s. per cwt., ex wharf, according to grade.
Sodium Nitrite.—MANCHESTER: £22 to £23 per ton, per ton lots.
Sulphur.—Finely powdered, 17s. 6d. per cwt. d/d; precip. B.P., 68s. per cwt.
Tartaric Acid.—MANCHESTER: 2s. 6½d. per lb.
Vegetable Lamp Black.—40s. per cwt., d/d.
Xylois.—MANCHESTER: 3s. to 3s. 4d. per gal.

New Control Orders

Nitric Acid Production

THE Control of Nitric Acid (No. 1) Order, 1940, which provides for the licensing by the Minister of Supply of producers of nitric acid has been made to take effect from December 2. Application for a licence should be made to the Ministry of Supply, Industrial Ammonia Control, 19 Berkeley Square, Bristol, 8.

Purchase Tax Adjustment

Damaged or Defective Goods

WHEN goods are damaged or destroyed on the premises of a registered firm (not being a separate retail branch or department thereof) no liability to Purchase Tax will ordinarily arise, on that account, if there has been no taxable sale or appropriation. The same applies where the damage or loss occurs while the goods are in transit to another registered firm who has bought them tax free as stock or materials, or to an export ship if they have been consigned abroad.

Also, where a registered seller under the terms of his contract or guarantee allows a credit or free replacement in favour of an independent person or firm (buying under a chargeable purchase) in respect of defective goods, of goods not up to standard or of goods damaged or lost in transit, a corresponding tax adjustment is allowable. No such adjustment is, however, permissible:—

- where such goods have been appropriated by a registered wholesaler or manufacturer to a separate retail branch or department of his business, unless credit or free replacement is allowed to the registered wholesaler by the firm from whom the goods were purchased;
- where the goods have been sold to an independent retailer, under terms which leave him responsible for the loss or damage; or
- where the goods are taken back after use merely in part payment for another article.

No abatement of tax is allowable in respect of goods lost or damaged, after delivery by a registered firm on the premises of a retailer or other unregistered person, whether by enemy action or otherwise.

Vitamins and Plant Growth

Recent Studies of their Stimulating Effects

THE recent availability of pure chemicals with vitamin-like properties has already had the effect of arousing interest in the possible influence of vitamins on plant growth. In this country the experiments of Tincker and Unwin at the laboratories of the Royal Horticultural Society indicate that vitamins may reinforce the action of recognised root-growth stimulants, such as β -indolyl butyric acid, although inactive in themselves. When vitamin B₁ (aneurin) was tested alone, for example, it did not induce root formation. Other experiments (*e.g.* by R. Dennison in the United States) point to a specific action of certain vitamin substances in increasing the growth of plants. Thus synthetic ascorbic acid, used in the form of a solution containing 10 parts per million in an aqueous nutrient solution, certainly stimulated the growth of tobacco; again, synthetic vitamin B₂ (Merck's riboflavin), used in a concentration of 2.5 parts per million, was a growth stimulant in the case of the egg-plant. Vitamins may also affect the health of plants just as they influence that of higher forms of life, judging by the work of Gol'din in the U.S.S.R. This worker observed that sound tobacco leaves contain far more ascorbic acid than leaves attacked by mosaic virus.

THE IMPORTATION OF ALUMINIUM into Northern Rhodesia is now prohibited, by Government order, except under licence.

General News

IT HAS NOW BEEN DECIDED that bituminous roofing felt material is not chargeable with Purchase Tax.

THE FORMATION OF the Abrasive Industries Export Group is now announced. Mr. W. M. Rowland is Chairman, Mr. J. A. Orchard is Secretary, and the address of the Group is Universal Works, Stafford.

DR. J. B. SPEAKMAN, of Leeds University, is reported to have discovered a method of producing rayon from seaweed. The material is stated to be not only insoluble in soap and soda, but soft to the touch, lustrous and fire resisting.

CORNISH CHINA CLAY SHIPMENTS were very low for October, Fowey alone shipping 37,283 tons less than in October, 1939. Total shipments were 20,307 tons compared with 34,191 tons in September last, and 71,514 tons in October, 1939.

THE DIRECTORS, STAFF AND WORKPEOPLE of British Glues and Chemicals, Ltd., and its subsidiary companies have sent a cheque for £5000 to the Ministry of Aircraft Production for the purchase of a "Spitfire." It will be remembered that Mr. Roger Duncalfe, chairman of the Association of British Chemical Manufacturers, is also a director of the above companies.

LORD HORDER'S COMMITTEE on the conditions in air-raid shelters has recommended spraying of the shelters to reduce the risk of air-borne infection. On account of its easy procurability, cheapness in bulk, and intrinsic merits, the antiseptic recommended is sodium hypochlorite in aqueous solution. The type of spray used will vary from hand-operated to mechanical apparatus, according to the nature of the shelter.

SIR BASIL BROOKE, Minister of Agriculture, suggested recently, in the Northern Ireland House of Commons, that the British Ministry of Agriculture may shortly introduce rationing of imported animal feeding stuffs. Mr. R. Elliott (South Tyrone—U.) said no similar scheme was proposed in Great Britain. Sir Basil Brooke replied: "I think Ulster leads the way; very shortly Britain will follow our example."

BRITISH DRUG HOUSES, LTD., Graham Street, London, N.1, have prepared a new edition of their Priced Catalogue of Laboratory Chemicals. Bearing in mind the great need for economy in the use of paper, they announce that this new edition must be limited; but it is hoped that copies will be available to all chemists to whom a currently priced catalogue of supplies is essential. An early application for a copy of the new catalogue is therefore advisable.

MOTOR SPIRIT MADE FROM SAWDUST was one of chemistry's new marvels outlined by Mr. William Mair, F.R.S.E., F.C.S., when addressing the Edinburgh Business Club recently. He explained how a new source of power alcohol was being extensively exploited in America. It comprised sawdust and wood waste—shavings, ends and pieces, roots and bark—all consisting mainly of cellulose. After treatment with acid at high pressure and high temperature, the cellulose broke up into glucose and other sugars. "This is partly utilised," said Mr. Mair, "for cattle feeding. The remainder is fermented to produce crude alcohol which, mixed with petrol, forms an efficient motor fuel."

Foreign News

TWO AMERICAN ENGINEERS, Camille Dreyfus and George Schneider, have patented a process for lengthening the life of outer covers of motor tyres by means of a 1:5 impregnation with tricresylphosphate.

SENATOR MCBRIDE, Australian Minister of Supply Development and Munitions, last week announced the establishment of an oil industry cartel, says Reuter. Its object will be to build up stores and to co-ordinate the oil tanker services to Australia.

REGISTERED AS KENYA MAGNESITE, LTD., a company has recently been formed to operate a deposit of magnesite in the Colony. A trial consignment of 500 tons, it is understood, has already been exported from England.

EXPORTS OF LINSEED from the Argentine during the first nine months of 1940 totalled only 655,000 tons, valued at 110,313,000 pesos, compared with 1,024,000 tons, valued at 143,814,000 pesos in the same period of 1939; exports of quebracho extract totalled 93,000 tons, valued at 23,462,000 pesos, as against 148,000 tons, worth 30,431,000 pesos.

From Week to Week

EARNINGS OF E. I. du Pont de Nemours and Co. for the nine months ended September 30, were equivalent to \$5.80 per share, compared with \$5.19 per share for the corresponding period of 1939.

A RECENT ORDER of the German Government forbids the use of pure oleic acid (red oil) for processing textiles. The use of textile soaps, dressings, and similar products, containing oleic acid is restricted to products approved by the textile manufacturers' association.

LACK OF GRAPHITE ELECTRODES is interfering with normal production at one of the two potassium chlorate plants in Spain. Under normal conditions Spanish output of potassium chlorate exceeds domestic requirements, and exports have been made to Latin America.

RECENT PROSPECTING has led to discoveries of scheelite, a tungsten mineral, in the Yellowknife district of the North-West Territories of Canada, which indicate that the area near the northern and eastern arms of Great Slave Lake may be a tungsten-tin zone. It is stated that extensive stakings of claims have followed showings of tin in the Bird River area in Manitoba.

A CONTRACT FOR THE CONSTRUCTION of a new war chemical plant near Winnipeg, announced in a joint statement issued by Hon. C. D. Howe, Minister of Munitions and Supply, and Hon. J. S. McDiarmid, Minister of Mines, Natural Resources and Industry for the Manitoba Government, has been let by Defence Industries, Ltd., to the Fraser Brace Engineering Co., Ltd. The plant is a duplication of plant now being completed by the Fraser Brace Company in Ontario.

AS A RESULT OF a recent agreement initialled at Batavia, Japan will receive a large increase in oil and petrol supplies from the Dutch East Indies. Concerned in the agreement are the Standard, the Vacuum and Royal Dutch Oil Companies. Japan is to get a total of 1,800,000 tons of oil annually under the agreement; of this total, 1,306,000 tons will supply Japanese oil companies and 494,000 tons will be distributed in Japan by the Royal Dutch, Standard and Vacuum Companies.

EXPORTS OF CARNAUBA WAX from Brazil in the first seven months of 1940 totalled 5700 tons, valued at £689,000 (gold), compared with 6300 tons, valued at £478,000, during the same period of 1939; exports of vegetable oils were 25,000 tons (£471,000), compared with 23,000 tons (£300,000); and exports of castor-seed 50,000 tons (£459,000), compared with 68,000 tons (£271,000). Imports of chemical products during the same period totalled 88,000 tons, valued at £1,094,000, compared with 77,000 tons, valued at £1,047,000.

A NEW POTENTIAL SOURCE of essential oil in India is suggested and examined by B. K. Malaviya and S. Dutt (Proc. Ind. Acad. Sci., Sect. A, 12, 3, 251-265) in a paper on the umbelliferous plant *Anethum soa*, which is allied to the European dill and fennel. The herb is used locally as a flavouring, having the strong aroma characteristic of its genus, but extraction of the oil from the green herb had not previously been attempted. It was found to contain a high proportion of α -phellandrene (74.6 per cent.) and small percentages of eugenol, iso-eugenol, thymol, and phellandral. The medicinal oil from the seeds, which is well known, was also re-examined in detail.

Forthcoming Events

SPECIAL AFTERNOON LECTURES before Christmas of the Royal Institution, 21 Albemarle Street, London, W.1, include a paper by Professor J. D. Bernal, who will speak on "The Physics of Air Raids," on December 3, at 2.30 p.m. Single lecture ticket, 2s. 6d.

A JOINT MEETING of the Chemical Engineering Group (Society of Chemical Industry) and the Institution of Chemical Engineers will be held on December 10, at 2.30 p.m., in the rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1, when a discussion on "The Salvage of Waste Materials in the Chemical Industry" will be opened by Dr. A. B. Manning, Assistant Controller of Salvage in the Ministry of Supply. The chair will be taken by the chairman of the Chemical Engineering Group, Mr. H. W. Cremer.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

NORTH BRITISH ALUMINIUM CO., LTD., Shrewsbury. (M., 23/11/40.) October 16, disposition by Mrs. B. Allan or Watt, with consent of the company in implement of Trust Deed dated September 12, 1934; charged on 17 Grange Terrace, Fort William. *—, March 28, 1940.

County Court Judgments

PATRICK, Robt., 8 Salisbury Terrace, Liverpool, 15. (C.C.J., 23/11/40.) Chemical worker. £35. September 24.

COOPER, Clayton, Lime Works, Holton, Wheatley. (C.C.J., 23/11/40.) Lime manufacturer. £35 19s. 11d. October 3.

BLYTH AND MARTIN (a firm), 1027 London Road, Thornton Heath. (C.C.J., 23/11/40.) Oil and colour merchants. £11 7s. 10d. September 24; £23 10s. 2d. September 18.

NAYLOR, Thos., 6 Trevelyan Place, Moldgreen. (C.C.J., 23/11/40.) Chemical worker. £10 8s. 9d. October 2.

Orders Made on Application for Discharge

BINNS, Fred, and BINNS, Maurice, 30, Queen Street, Haworth, Yorkshire (O.M.A.D., 23/11/40.) Soap Manufacturers. Date of Order—Oct. 9, 1940 Bankrupts' discharge refused.

Companies Winding-Up Voluntarily

PHOSPHATES Ltd. (C.W.U.V., 23/11/40.) Cecil Edgar Peers, 18, Cophall Avenue, London, E.C.2, Liquidator.

Winding-Up Petition

R. G. HARBOTT & CO., LTD., Victoria Works, Romford Road, Forest Gate., E.7. (W.U.P., 23/11/40.) Date of Order, November 4, 1940. Date of presentation, August 27, 1940.

Company News

B. Laporte, Ltd., announce an interim dividend of 5 per cent. (same).

The Directors of **Minimax, Ltd.**, have declared an interim dividend of 8 per cent. actual, on £125,000 (same as last year), payable on or after December 2.

Reckitt and Sons, Ltd., announce a quarterly dividend and interest on $\frac{1}{2}$ per cent. and 5 per cent. preference stock and 4 per cent. debenture stock, together with interim dividend of 5 per cent. on ordinary stock, payable January 1 (same).

Cumming, Parsons, Ltd., manufacturing chemists, Lilley Street, Queen's Road, Manchester, 9, have increased their nominal capital beyond the registered capital of £10,000 by the addition of £5000 divided into 4000 6 per cent. cumulative preference, and 1000 "A" ordinary shares of £1 each.

Dorman, Long & Company, Ltd., report a trading profit of £1,395,929 for the year ended September 30 (last year £1,481,395). In addition to dividends on the $\frac{6}{8}$ per cent. first preference and 8 per cent. second preference shares, the directors recommend a payment of 15 per cent. on the preferred ordinary and 7 per cent. on the ordinary shares, all less tax, payable January 1. A year ago the preferred ordinary dividend was 18 per cent., and the ordinary 10 per cent.

New Companies Registered

Cross & Max (Agencies) Ltd. (363,914).—Private company. Capital: £1000 in 100 ordinary, and 900 5 per cent. cumulative preference shares of £1 each. Manufacturers of and dealers in chemicals, gases, drugs, etc. Subscribers: Alexander W. Sampson, David H. Young. Solicitors: Pickard and Co., 87 Regent St., W.1. Registered Office: 87 Regent Street, W.1.

J. & K. K. Cutt, Ltd. (363,897).—Private company. Capital: £100 in 100 shares of £1 each. Consulting, mechanical, electrical, civil, chemical, hydraulic, lighting, sound, ventilating and general engineers, etc. Directors: Jas. Cutt and Kenneth K. Cutt. Registered Office: 7a Eden Grove, Holloway, N.7.

G.M.L. Supplies Ltd. (363,918).—Private company. Capital: £100 in 100 shares of £1 each. Manufacturers of and dealers in laboratory, observatory and scientific instruments, chemicals, gases, drugs, oils, etc. Directors: Chas. L. Grimwood, Frank Grimwood, Victor Lewis, Geo. Madden. Registered Office: 54 City Road, E.C.1.

British "Peta" Flux, Ltd. (363,947).—Private company. Capital: £1000 in 1000 shares of £1 each. Manufacturers of and dealers in solders, fluxes, adhesives, metals, compounds, chemicals, etc. Subscribers: Chas. R. Webb, 25 Ethelburga Street, S.W.11. Solicitors: Stephenson Harwood and Tatham, 16 Old Broad Street, E.C.2.

Van Leer Industries, Ltd. (363,815).—Private company. Capital: £100 in 100 shares of £1 each. Manufacturers of and dealers in metal and other drums, containers, boxes and receptacles for containing bituminous emulsion, asphalt, oil and other substances, manufacturers of and dealers in kegs, barrels, boxes and containers of steel, wood, cardboard, fibre, pulp, plastic or other materials, etc. Subscribers: Horace G. G. Cox and Ernest T. Horne, both 31 Old Jewry, E.C.2. Solicitors: Freshfields, Leese and Munns, 31 Old Jewry, E.C.2.

Chemical and Allied Stocks and Shares

THE rise in security values in evidence last week has received a moderate check in the absence of further improvement in demand, but only a small part of recent gains was lost. Moreover, very little selling was reported, and firmness was shown in British Funds and high-class investment securities. Market sentiment was governed by a disposition to await the next turn of events in the war and international news.

Although best prices recorded in the past few days were not held, Imperial Chemical were higher on balance at 29s. 3d. compared with 28s. 6d. a week ago. Moreover, the company's preference units were better at 31s. 3d. At 64s. 4½d. Turner and Newall showed a gain of 1s. 3d., and on balance British Oxygen moved up from 63s. 9d. to 65s. 7½d., while British Aluminium were 42s. 6d. compared with 41s. 3d. a week ago. British Match have been marked up from 28s. 9d. to 30s. 6d. at the time of writing, while the ordinary units of the Distillers Co., advanced from 60s. 3d. to 63s., partly owing to confidence in the market that the forthcoming interim dividend will be maintained. Lever and Unilever at 24s. 9d. were unchanged on balance, and British Oil and Coke Mills preferred ordinary shares made a slightly higher price of 34s. Both International Paint and Indestructible Paint have been marked up to 70s. to the time of writing, but Pinchin Johnson were easier at 19s., although Goodlass Wall made the higher price of 9s. 6d., and Wallpaper Manufacturers deferred units improved from 18s. 1½d. to 19s. 3d. B. Laporte were again around 50s.

Associated Cement became easier at 61s 10½d. and, where changed, other cement shares lost a few pence, although British Plaster Boards at 13s. were higher on balance. The financial result of Dorman Long and Co. came as a disappointment to the market because of the lower dividend, and iron, steel and kindred securities lost part of their recent advance. Dorman Long ordinary shares reacted sharply to 20s. United Steel were 21s 6d. and Consett Iron 6s. 9d., while Stewarts and Lloyds were 40s. 9d., but on the other hand, Staveley ordinary shares were steady at 43s. 3d. Ruston and Hornsby were 9d. better at 23s 9d. Dunlop Rubber reacted moderately, but at 33s. 3d. were higher on balance; the market is talking of the possibility of a small improvement in the distribution for the current year. Metal Box were firm at 70s.; general expectations are that the interim dividend will be maintained.

Greeff Chemicals 5s. units were again quoted at par, and Monsanto Chemicals preference shares were 21s. 3d., while William Blythe 3s. shares at 5s. 3d. were also the same as a week ago. Elsewhere, Morgan Crucible 5 per cent. preference were quoted at 18s. 9d., and business in British Blues participating preference shares took place around 26s. Reckitt and Sons ordinary were firm at 88s. 9d. on the maintenance of the interim payment.

Triplex Glass were 19s., and United Glass Bottle ordinary kept at 43s. 6d., while Canning Town Glass were around 5s. Moreover, General Refractories held their recent improvement to 7s., and Imperial Smelting were again 10s. 3d.; the $\frac{6}{8}$ per cent. preference shares of the last-named company have been obtainable in the market at 20s. 3d. In other directions, Amalgamated Metal shares went back 6d. to 18s.

Boots Drug remain easier and were quoted a few pence lower at 40s., but Sangers were better at 19s. on hopes that the interim dividend will be maintained. Timothy Whites were also quoted at 19s. British Drug Houses were 21s. 3d., while Borax Consolidated deferred moved up from 26s. 3d. to 26s. 10½d. on satisfaction with the repetition of the half-yearly dividend on the preferred unit.

Barry and Staines kept last week's rise to 28s. 7½d. "Shell" and most other leading oil shares were higher on balance.

Inventions in the Chemical Industry

Applications for Patents

CALCIUM BASE ALLOYS.—A. Abbey (Dow Chemical Co.). 14893.
MAGNESIUM BASE ALLOYS.—A. Abbey (Dow Chemical Co.). 14894, 14895, 14896.
CENTRIFUGAL SEPARATORS for extracting solids from liquids.—W. Alexander. 14869.
BRANCHED-CHAIN ALKENES.—Anglo-Iranian Oil Co., Ltd., E. W. M. Fawcett and J. H. Beynon. 14987.
PRODUCTION OF ARTIFICIAL RESINS.—British Thomson-Houston Co., Ltd. (United States, October 31, '39.) 14995, 15042.
PREPARATION OF FLUORESCENT MATERIALS.—British Thomson-Houston Co., Ltd. (United States, Oct. 28, '39.) 15041.
TITANIUM PIGMENTS.—British Titan Products Co., Ltd. (United States, Oct. 4, '39.) 14850.
PRODUCTION OF ANODIC COATINGS ON ALUMINIUM.—C. R. Byrne. 14889.
PRODUCTION OF SYNTHETIC RESIN EMULSIONS.—Calico Printers' Association, Ltd., and L. A. Lantz. 14885.
MANUFACTURE OF SYNTHETIC RESINS.—Calico Printers' Association, Ltd., L. A. Lantz and A. Schofield. 14969.
APPLICATION OF POLYTHENES.—C. L. Child, R. B. F. F. Clarke, B. J. Habgood, and Imperial Chemical Industries, Ltd. 15011.
METHODS OF COMPOUNDING LUMINESCENT MATERIALS.—R. L. Demuth. 15020.
PRODUCTION OF VINYL HALIDES.—Distillers Co., Ltd., H. M. Stanley and J. E. Youell. 14963.
MANUFACTURE OF POLYMERIC MATERIALS.—E. I. du Pont de Nemours and Co. (United States, Oct. 5, '39.) 14907.

Complete Specifications Accepted

GAS-PRODUCERS.—K. Willans and D. S. Kennedy. March 14, 1939. 526,358.
MANUFACTURE OF WATER-SOLUBLE CELLULOSE ETHERS.—W. R. Davis, and Imperial Chemical Industries, Ltd. March 14, 1939. 526,370.
SEPARATION OF BUTADIENE from hydrocarbon mixtures containing same.—Dow Chemical Co. April 2, 1938. 526,387.
OBTAINING CELLULOSE for the manufacture of rayon from resinous pine woods.—F. C. Palazzo. March 16, 1938. 526,399.
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